

Disaggregation and assessment of estuarine pressures at the country-level to better inform management and resource protection – the South African experience

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<https://www.tandfonline.com/doi/abs/10.2989/16085914.2022.2041388>

Abstract

Globally, the ability of estuaries to sustain functionality and productivity is deteriorating rapidly under ever-increasing anthropogenic pressures. We present a systematic approach to identify, characterise and rank global pressures affecting estuaries. Six main pressure categories are reviewed: freshwater flow modification; pollution; exploitation of fish and invertebrates; land-use and development; manipulation of inlets; and biological invasions (plants and fish). Patterns in pressure effects are evaluated across biogeographic regions and estuary types. Activities contributing to these pressures are identified to prioritise management interventions and assessments of the trajectories of change and data availability are estimated, with associated confidence ratings on these. Approximately 15% of national estuarine area is under severe flow modification pressure. Land-use and development result in severe pressures on 40% of the area. Approximately 15% of inlets are artificially manipulated, which affects 60% of estuarine area. Pollution places 34% of the area under severe pressure and 78% of the area is severely impacted by overfishing. Invasive terrestrial vegetation has infested a third of South African estuaries, and aquatic invasive plant species occur in at least 8% of estuaries. Alien or extralimital (translocated) fish cause severe pressure in 35% of the estuaries. Management responses to mitigate these impacts are recommended for systems under severe pressure and future research directions are identified.